

Metropolitan Sewers.

PRINCIPAL OFFICE,

No. 1, GREEK STREET, SOHO,

September 3rd, 1849.

Ordered by the COURT, 30th August, 1849,—

On the Motion of MR. BULLAR, and MR. HAWES,—

“ That Mr. GOTTO, Assistant Surveyor, do communicate with the WESTMINSTER IMPROVEMENT COMMISSIONERS as to the Sewerage of the intended New Street in Westminster, and Report thereon to the WORKS COMMITTEE at their next Meeting.”

REPORT.

IN order to a right decision upon the subject referred to me in these instructions, it will be necessary to make a few comprehensive observations on the requirements of the whole of this district.

These requirements are *twofold* and *distinct*: the relief from surface and subsoil water, and relief from house drainage.

Although the present fearful condition of the district generally, renders both of them most urgent, yet works, effecting each and either object, may be executed independently of, and without prejudice to, the other.

The Commissioners are, however, at present only in a condition to deal with the former, because the *outfall* for the drainage of surface and subsoil water is already provided,—namely, the river Thames; while the outfall for house drainage is now under the consideration of the Court; and some time may elapse before it is decided upon.

It is obvious, therefore, that a practical recommendation can only at present be made with reference to the surface and subsoil drainage.

It happens that the nature of the strata in this district is such as to render this a work of primary and paramount importance, necessary to be executed *before* any practical steps can safely and economically be taken, with respect to tubular house drainage.

It has been ascertained, from actual borings and observations, that beneath the made ground there exists a great depth of peat, sand, and gravel, overlaying the blue clay, and forming a sort of extensive reservoir of water falling upon this flat district, and draining from the hills above: that this water stands within about six or seven feet of the surface, and is penned back, and prevented draining naturally into the river, by the pressure of every tide.

The average depth of the existing sewers in Westminster is ten feet below the surface; they are therefore of no avail for the drainage of the subsoil below that level.

The Westminster Improvement Commissioners have found it impracticable to construct the cellars, basements, and foundations of their proposed new buildings from this cause; and on that account their works are at a stand still, in which condition they must remain, as well as all permanent works of house drainage, until the level at which the water now stands in the soil is lowered at least six or eight feet below its present level.

A deep "surface and subsoil sewer" passing through the middle of the low flat part of Westminster, is, in my judgment, the only remedy that will strike at the root of the present evil.

Whichever plan of outfall for house drainage may ultimately be adopted, such a sewer, I respectfully submit, must inevitably be constructed, with an outfall into the river near low water mark; and there does not appear to be any reason to delay a work, for which there exists such eminent and urgent necessity, until the question of house drainage outfall, now under consideration, shall have been determined, this being an independent work, and one which must be *accomplished* before the other can be *commenced*.

Any work of sufficient extent to relieve the Westminster Improvement Commissioners from their present difficulties, must plainly be the groundwork of the drainage of the whole of this district.

And as various recommendations have been made from time to time on this subject by the Consulting Engineer and the Chief Surveyor, whose Reports have been under the consideration of the former and present Commissioners for two years, it is necessary to explain to what extent, and wherefore, the "surface and subsoil sewer" here proposed to be constructed without delay, differs from the works recommended by them, and this I do with the greatest respect.

The fundamental principle of separating the surface and subsoil drainage from the house drainage, upon which my recommendations are founded, and which is now so generally admitted, does not appear to have entered into the plan of the Consulting Engineer as applied to the City of Westminster, in his Report of the 9th of February, 1848, the whole of the rain and storm water passing along with the house drainage through the tubular drains into the general receptacles or sumpts.

Neither is there in that plan any provision for relieving the subsoil from the water with which it is now overcharged, although the necessity of such a work is admitted as a principle in that Report.

The Chief Surveyor, in his Report on this subject to the former Commissioners, dated 27th August, 1847, proposed a line of sewer (which was ordered to be executed, but never accomplished, in consequence of the dissolution of that Commission,) with the outfall at low water at Richmond-terrace, and passing at a great depth (sufficient to drain the subsoil which he contemplated) along Parliament-street, across the Broad Sanctuary, to the commencement of the proposed New Victoria-street.

The Chief Surveyor at that time did not, as now, see the necessity of separating the surface and subsoil drainage from the house drainage, and therefore the sewer he proposed was intended to convey the house drainage as well as the rain water, and consequently it became necessary to cover over the sewer to low water mark, in order "that no disagreeable odours might arise, and that the air along the shore might be pure and healthy."

The line of the New Victoria-street passes through the centre and the lowest part of the flat district of the City of Westminster, and is the most advantageous line, on that account, for the construction of this sewer.

The King's Scholars'-pond main sewer crosses the western extremity of the new street, but its invert at that place is only seven feet six inches below Trinity high water datum, and but five feet below the surface of the adjoining ground; it is evident, therefore, that at its present level it cannot afford an outfall for the proposed sewer. It is true there are sudden falls between this point of the King Scholars'-

pond sewer and its outlet at low water, which might be removed, and the bed of this main valley line deepened to the extent of several feet, and in such a case there would be an outfall provided, although an imperfect one. But I do not consider it expedient to recommend, under existing circumstances, the execution of such a work, because it would involve an enormous cost, and it might be desirable ultimately to intercept this sewer, so that the upland waters which it conveys, instead of flooding this low district, and frequently causing serious damage, may be diverted along the skirt of the higher ground and discharged into the river above the influence of the tide. And further, because if this main sewer were deepened as suggested, it would not afford so deep an outfall as can otherwise be obtained into the river itself, at a less cost, one mile and a-quarter lower down, at Richmond-terrace. It is to be observed, that the bed of the river has been deepened several feet about this place since the removal of Old London Bridge.

The point of outlet into the river first suggesting itself, is at Westminster Bridge, but it is expected the work could not be attempted with safety to the present old structure, and might interfere with any plan hereafter adopted for the construction of a new bridge.

And therefore the *direction* and *outfall* described in, and already quoted from, the Report of Mr. Phillips, is, in my opinion, the most appropriate and judicious, and calculated to answer the ends sought to be attained by the recommendations of this Report.

The *inclination* I propose would be five feet in a mile.

The *length* of this sewer, from Richmond-terrace to Victoria-street, would be 2,200 feet, and along Victoria-street 3,000 feet, to the King's Scholars'-pond sewer, under the invert of which it would pass at a depth of four feet, in order to afford a deeper outlet than the King's Scholars'-pond sewer for the relief of several streets beyond.

The *size* of the sewer would be five feet in diameter at the outlet as far as Victoria-street, and the remainder four feet diameter; this would afford sufficient reservoir capacity during the time the tide would be above the outlet.

The *depths* below the surface at which the sewer would be constructed, are shown on the accompanying section.

Its *total cost* would be £8,142; of this amount £4,767. would be expended in bringing up the sewer from Richmond-terrace to the commencement of Victoria-street, and should be defrayed out of the District sewers rate (section 78). The

remaining £3,375, being the estimate for the length in New Victoria-street, should be paid into Court by the Westminster Improvement Commissioners, which they are prepared to do immediately.

This sewer is intended to receive the water which is *now* held back in the soil, and would *then* percolate into the upper part of the sewer, which would be of brick-work and partly permeable, and the lower part should be of solid blocks set in cement, and water-tight.

The surface water would also be conveyed into it by gully-drains, furnished with sand-traps, to prevent the grit and detritus passing into the sewer.

The water thus brought into the sewer, would be there retained, until the falling of the tide allowed a free discharge into the river, without the aid of pumping.

As the water would be comparatively clean, and in no degree prejudicial to health, it would not be necessary to flap the *gully-drains*, nor construct ventilating shafts. Certain *side-entrances* would be required, which have been provided for in the estimates.

After the construction of this sewer, a constantly discharging system of house drainage may at any time be effected, into some deep and efficient outfall, by pipe drains, without any difficulty whatever.

In building the new houses in Victoria-street, great benefits, in *dryness, comfort, and stability*, may be acquired, by laying down, under the whole site of each house, a system of permeable earthenware drain pipes, of about one and a half inches in diameter, communicating with this sewer. The early decay of houses, and injury to the health of the inhabitants, known to arise from the want of such precautions against the damp, make it obvious that this would be a work of economy.

I beg therefore to recommend:—

First. That a new surface and subsoil sewer, five feet in diameter, be constructed from Richmond-terrace, Whitehall, along Parliament-street, and across the Broad Sanctuary at Westminster, to the commencement of the New Victoria-street, a distance of 2,200 feet, and that it be continued along the New Victoria-street, four feet in diameter, for a distance of 3,000 feet, at the several depths and inclination shown on the section, and at an expense of £8,142, on condition that the Westminster Improvement Commissioners pay into this Court the sum of £3,375.

Secondly. That the most advantageous mode of executing the work would be by contract upon tender, for the performance of the whole, and maintaining the same in repair for a term of five years. (Section 65.)

Thirdly. That, as the interruption of traffic consequent on the construction of this sewer along Parliament-street and the Broad Sanctuary, would result in serious inconvenience if executed during the sitting of Parliament; and as the Westminster Improvement Commissioners are daily suffering great loss and detriment to their property by the delay of this work, which, if executed, would effectually relieve them, as well as the entire district, I respectfully urge the advisability of the work being immediately proceeded with.

Fourthly. That, should the Court order the works here proposed, the Westminster Improvement Commissioners be requested to submit their plans and sections, showing the intended levels of the new street. (Section 56.)

Fifthly. That, as Richmond-terrace is Crown property, the Surveyor to the Commissioners be instructed to put himself in communication with her Majesty's Commissioners of Woods, &c., with a view to procure their acquiescence for constructing the proposed sewer under the roadway in front of that terrace.

(Signed) E. GOTTO.

Having carefully read over the Report of Mr. Gotto on the drainage of the City of Westminster, I beg respectfully to state, that it is desirable to construct one or more deep sewers through that district, in order to relieve the subsoil of the water with which it is now surcharged, the present sewers not being sufficiently deep for that purpose. I, therefore, fully concur in the recommendations of Mr. Gotto's Report; and I would urge, that the works be put in hand as soon as possible, so as to relieve that district of at least a portion of the ill health and discomfort now so rife there.

(Signed) JOHN PHILLIPS,

6th September, 1849.

CHIEF SURVEYOR.

REPORT OF THE
COMMISSIONER OF THE
LAND OFFICE

OF THE
LANDS BELONGING TO THE
UNITED STATES

FOR THE YEAR
ENDING 1881

IN
RESPONSE TO A
RESOLUTION OF THE
HOUSE OF REPRESENTATIVES
PASSED MARCH 3, 1879

BY
JAMES M. SMITH,
COMMISSIONER OF THE
LAND OFFICE

233

Metropolitan Sewers.

REPORT OF MR. GOTTO

ASSISTANT SURVEYOR,

AS TO THE

SEWERAGE OF THE INTENDED NEW
STREET AT WESTMINSTER.

30TH AUGUST, 1849.

By Authority.

JAMES TRUSCOTT,
Printer and Publisher to the Commission,
Nelson Square, London.